

Rules for Access to the Small Animals Imagery Service

Introduction

As part of the future investment programme named “National Biology and Healthcare Infrastructure” under the Healthcare and Biotechnology scheme initiated in 2011 by the French investment commission (CGI), the French ministry for higher education and research and the French national agency for research (ANR), the CNRS, INRA and UJF have come together to register a project identified as “Ecosystems Analysis and Experimentation - Service (AnaEE-S)”.

These rules are aimed at defining the modalities of access to the ***MRI – small animals (Theoretical and experimental ecology station (SETE), UMR 5321)*** offered by the AnaEE-France Infrastructure and setting down the rights and obligations of users.

Article 1. Scope of the rules

These rules are aimed at presenting the following:

- System and service offer,
- Project submission procedure,
- Project selection procedure,
- Modalities of use of the service and consequent obligations,
- Modalities of exploitation of the results of the use of the service.

Article 2. Brief description of the system and services offered

The small animals MRI laboratory offers a 4.7 Tesla cryogen-free superconducting magnet MRI system with high gradients, capable of working with animals/samples up to 7 cm* in diameter. The laboratory has several coils suitable for different sizes and shapes, which can help obtain images with very high resolution.

The applications are many: organ morphology, structural morphology, cerebral imagery, anatomy, spectroscopy (metabolite detection), diffusion imagery and functional imagery.

The animals must be anaesthetised/immobilised during the acquisition process. To that end, an anaesthesia system (isoflurane) is available to users.

All these non-invasive measures are taken *in vivo*, meaning that the animals are not sacrificed and may be used in long-term studies with repetitive measurements during their development.

- **Technical specifications**

Name	MR SOLUTIONS MRS 4717
Magnetic field (T)	4.7 Tesla
Bore diameter (cm)	17 cm
Open bore diameter (cm)	7 to 10 cm *(elliptical 7 cm x 10 cm)
Limit 5 gauss radial/axial (m)	0.75/1.25 (m, from centre of magnet)
Gradients (mT / m)	X: 486 mT/m Y: 470 mT/m Z: 630 mT/m
No of emission channels	2
No of reception channels	4
Slew rate (T/m/s)	4700 T/m/s
Homogeneity on one cylinder (60 mm x 60 mm; ppm)	30 mm: +/- 0.1 ppm 60 mm: +/- 1 ppm
Stability (ppm/hour)	< 0.05 ppm/hour (intrinsically stable)

- **Animal handling**

The system also includes the accessories below:

- Positioning system and bed.
- Animal handling: front and rear access (magnet); beds with arrangements for anaesthesia and integrated temperature control (cooling and heating).
- Monitoring for: temperature control, respiration and respiratory and cardiac synchronisation.
- Isoflurane anaesthesia system.

- **Resonators/Antennas and beds**

Along with the supplier's research and development team, the Unit has developed special beds and resonators/antennas for examining small animals.

Users are responsible for determining the sizes and shapes of the coils and beds specific to their species. If our four coils do not cover the needs, users are responsible for procuring additional equipment (developed and/or adapted beds and coils).

- **IT architecture**

Acquisition computer with steering software: Precliniscan and Easyscan.

Computer system for analysis: two monitors, analysis software.

Article 3. Governance of service

The service is managed by a scientific manager and a technical manager. The managers are supported by a local committee including:

- the scientific and technical managers of the service,
- the manager of the animal welfare cell of the unit
- at least one scientist from the AnaEE-France infrastructure who is not a member of the service management unit

- if possible, at least one foreign researcher with expertise in the area of the service, preferably belonging to the AnaEE-Europe network.

That local committee must be organised with pre-existing committees. The members of the local committee may, where necessary, ask for the help of an expert, particularly in the Small Animals MRI area.

They are responsible for selecting projects and prioritising them, with a view to optimising the load of the service.

Article 4. Project submission procedure

Users must involve the scientific and technical managers in the construction of the project.

Eventually, the AnaEE-France website/ISIA (Information System for Infrastructure Administration) platform will be the sole portal for the submission process. In the meantime, an interim procedure is in place.

Article 5. Definition of project selection protocol

Prerequisite:

In the event of animal experimentation or experimentation in the natural environment, the matter is to be referred to the ethics committee with oversight.

5.1 Project registration

The project submission protocol involves five steps:

Step 1. The project initiator contacts the service manager at SETE (Olivier Guillaume), who sends them the agreement, including the Interim Service Usage Rules.

Step 2. Project description: The project initiator provides information about their project, its execution and funding.

Step 3: Project submission: When the project description is entirely completed, the initiator submits it to the service manager in electronic format, for presentation to the local committee.

Step 4: Review by the local committee: The local committee then reviews the project. It is then asked to complete its assessment criteria.

Step 5: Final opinion of the local committee: after a review, the local committee issues a final opinion of the project. Projects may be:

- accepted,
- accepted on certain conditions,
- accepted with modifications (which would lead to a new submission process)
- rejected.

5.2 Selection criteria

Projects that involve the use of samples or animals with biological risks of level 2 and above will not be considered.

5.2.1 Analysis criteria

Based on the purposes and the characteristics of the service, the local committee has the task of taking into account criteria relating to the technical feasibility and scientific value of the proposed projects.

The criteria are:

	Excellent	High	Medium	Low	Unsuitable
Scientific value					
Technical feasibility					
Schedule feasibility					
MRI expertise					
Overall assessment					

5.2.1.1 To that end, the needs and requirements of the project will be quantified and examined.

5.2.1.2 Projects that have undergone a scientific investigation on the national level will be exempted from a scientific assessment by the local committee. The load applied on the service will be considered in any case. The projects presented will be built jointly with the service in any case.

When the demand from acceptable projects is greater than the service capacity, the following criteria will be applied to rank the acceptable projects:

Projects financed by European agencies in order to promote the international use of the services.

Projects financed by French research institutions.

Projects financed by agencies in collaboration, including with foreign countries
other projects.

Particular attention will be paid to projects submitted by users from the private sector with a view to transferring the results of research and mobilising additional sources of funding to ensure the sustainability of the services and their improvement.

If a project is presented with no preliminary funding, the local committee reserves the possibility to make the service accessible under a specific research collaboration agreement in view of the particular value of the examined project.

5.3 Monitoring of selection

The AnaEE-France executive committee will have an overview of the projects conducted within the infrastructure and will guarantee the fairness of project selection. For its part, the scientific council will ensure the scientific consistency and international scope, and the appropriateness of projects for the goals of the infrastructure.

Article 6. Project implementation: modality of use of the service and associated obligations

6.1 Modalities of use

6.1.1 User categories

Users must be found to be sufficiently experienced by the local committee to operate the system. Otherwise, users may ask for support from the technician in charge when the project is submitted.

6.1.1.1. Trainees

Trainees may be received providing they are accompanied by the technician who is in charge (by request at the time of the submission of the project) or by their manager, who must be found to be sufficiently experienced by the local committee.

6.1.1.2. Scientists

Scientists will be received by the small animals MRI laboratory subject to the technical feasibility/schedule and scientific quality of the project.

6.1.1.3. Private sector

Users from the private sector may use the small animals MRI laboratory under a collaboration agreement and subject to the technical feasibility/schedule and the scientific quality of the project/application.

6.1.1.4. Training programmes

Training programmes may use the small animals MRI laboratory if the instructor has a level of expertise that has been found to be sufficient by the local committee and after acceptance by the Midi-Pyrénées Regional Delegation. The MRI system may be used as a training tool but the laboratory cannot train users.

6.1.1.5. Others

Visitors/guests, for example, journalists, colleagues, or institutional parties may be received by the small animals MRI laboratory subject to schedule feasibility and the opinion of the local committee (importance of the reason). In no event may such categories of users be permitted to operate or handle the equipment.

6.1.2 Access to the premises

Access to the premises is subject to compliance with the regulations of SETE.

Access to the MRI laboratory premises is restricted, with the help of locks and keys. Support from the technician responsible is necessary in the cases stated below (Article 6.1.10) and where found to be necessary by the local committee. A key may be given in the event of long-term experiments to users whose expertise is believed to be sufficient by the local committee.

6.1.3 Access to sites and equipment

Users must have a formalised agreement (written agreement or travel order) from their organisation of affiliation.

The theoretical and experimental ecological station offers additional services. The use of some services may lead to an extra charge and shall be specified when the project is submitted. For example:

- Accommodation
- Common room/dining room
- Surgery room
- Animal house chemistry labs with summer refrigerator freezer
- Workshop

These additional services shall be under the control of SETE. They shall be used subject to availability and feasibility and their use shall be at the discretion of the managing bodies for each service in SETE. These services shall be booked directly with SETE and shall be charged separately.

The small animals MRI laboratory will provide the users with the following:

- 4.7 Tesla MRI system
- Selection of antennas/resonators
- Animal monitoring equipment
- Anaesthesia system (isoflurane)
- Imagery analysis computer

SETE may restrict the use of some equipment to the user personnel (permits, specific skills requirements).

6.1.4. Human resources support

Users will be received by the technical manager and quickly made familiar with common areas, the different buildings, the location of the MRI laboratory and reception. Upon their arrival, the regulations and safety systems will be explained, and the facility regulations will be handed over at that time.

Support by laboratory personnel is possible if required by the user when the project is submitted, or may be imposed by the local committee in accordance with the user category or level of expertise.

	Security tour	Access to preparation room	Access to MRI room	Operating of MRI system	Operating of animal monitoring equipment, including anaesthesia system
Trainees	Yes	Escorted	Escorted	Escorted	Escorted or after training
Scientists	Yes	Yes	Yes, on certain conditions	Subject to the judgement of the local committee	Yes, after training if necessary

Private sector	Yes	Yes	Yes, on certain conditions	Subject to the judgement of the local committee	Yes, after training if necessary
Training programmes	Yes	Yes	Yes, on certain conditions	Subject to the judgement of the local committee	Yes, after training if necessary
Others	Yes	Escorted	Escorted	No	No

6.2 Obligations associated with the use of the service

6.2.1 Compliance with the regulations of the service management unit

Users shall comply with the laboratory rules and the regulations of the unit.

SETE is a laboratory with level 1 safety classification. As a result, the small animals MRI laboratory cannot accept projects requiring the use of samples or animals with biological risks of level 2 and above.

6.2.2. Environment protection

6.2.2.1. The service management unit puts in place the tools required for minimising the impact of its activities on the environment and optimises recycling: waste management, energy management in buildings, use of water resources etc.

6.2.2.2. The work shall be exemplary in terms of environmental protection (controlled damage of the environment).

6.2.3. Rights and obligations relating to the use of the premises

Proper use of the premises. The user agrees to make their best efforts to maintain the premises in the condition in which they were provided by SETE.

6.2.4. Rights and obligations relating to samples

Any live animals brought in by the users must be taken away by the users.

If there are any deaths during the experiments on the site of SETE, the bodies shall be disposed of in the manner required by the laboratory management for biological material.

Waste (liquid, solid etc.) resulting from the handling of animals/samples shall be disposed of in the manner required by the laboratory using the means put in place by the laboratory management (see regulation of laboratories).

6.2.5. Rights and obligations relating to animal experimentation

Animal experimentation requires preliminary permission from the competent authorities. To that end, users shall refer their work to the competent ethics committee.

Handling shall comply with the approvals of the establishment in the area of animal experimentation.

For projects involving animals, users shall be trained in animal experimentation or shall work under the responsibility of an individual approved for animal experimentation.

Handling of animals, injections, surgery procedures and anaesthesia may be performed in the preparation room. Only anaesthesia using isoflurane may be applied in the imagery room.

Recovery monitoring shall be carried out in the room provided for that purpose, in conditions that comply with animal welfare and under the responsibility of an individual approved for animal experimentation. The operator shall ensure that the conditions of transfer between the MRI room and recovery room comply with animal welfare requirements. The protocol proposed shall be specified when the project is submitted.

The MRI laboratory does not have a hood and the use of volatile toxic chemicals is therefore not permitted.

Animal experimentation regulations and hygiene regulations for animal experimentation shall be followed.

6.2.6. Rights and obligations relating to the use of equipment.

USERS WITH CARDIAC PACEMAKERS AND OTHER SIMILAR DEVICES SUCH AS FERROMAGNETIC IMPLANTS SHALL NOT BE ADMITTED INTO THE IMAGERY ROOM. If you believe you have a medical condition that puts you at risk, please contact your general practitioner.

Only competent users who have been accepted by the local committee shall be allowed to operate the imagery system.

The system and equipment shall be operated only in the manner described in the instructions for use. Any development and manipulation of the protocols and/or existing equipment shall be carried out in collaboration with SETE and the manufacturers of the system/equipment.

The use/need for the work/analysis computer shall be specified when the project is submitted. Access to the data on the computer shall be restricted only to the data of the user. Each user shall have access to a specific 'user session' with password protection.

The use of the work/analysis computer shall only be permitted during the duration of the experiments.

Any failure to comply with the regulations set out in the documents associated with the operating of the system and posted in the small animals MRI laboratory shall lead to the termination of the imagery agreement, cancellation of incomplete scans and potential future access restrictions, and also financial liability for damages sustained or for the maintenance required due to the non-compliance.

6.2.7. Publication

All publications as part of projects shall refer to the contribution of each member and shall indicate the aid of the ANR with the following words “This work has benefited from state aid managed by the French national research agency under the Future Investments programme bearing the reference ANR-11-INBS-0001AnaEE-Services”. The indication shall feature in the rules for services.

In the event of a service supply, in addition to the acknowledgements stated above, the User shall acknowledge the service used and the operator or operators mobilised during the use of the service.

Article 7. Agreement framework for the use of the service

Any access to the platform shall be formalised in accordance with administrative and financial procedures applicable at the theoretical and experimental ecology station of the CNRS in Moulis. Any disputes that cannot be settled amicably shall be reported to the executive committee of AnaEE-France. In the event of a failure to comply with the rules defined herein, the platform manager may forbid access to the installations and data as a protective measure, without prejudice to proceedings or sanctions that may be taken against the users by the injured parties.